



Model Optimization and Tuning Phase Template

Date	15 July 2024
Team ID	team-740077
Project Title	Online Payments Fraud Detection
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation (6 Marks):

Model	Tuned Hyperparameters	Optimal Values
Random Forest Classifier	_	1.Random Forest [27]

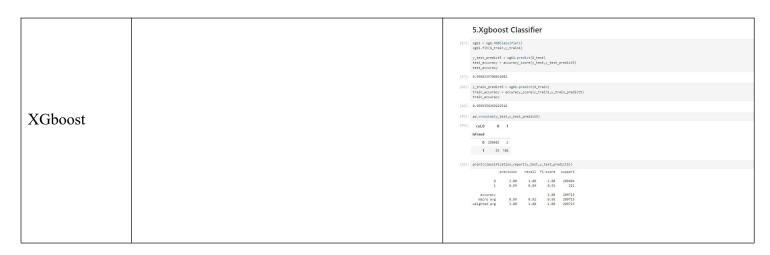




Decision Trees Classifier	2.Decision Tree
Extra Trees Classifier	3.ExtraTrees Classifier
SVM Classifier	### ### ##############################







Performance Metrics Comparison Report (2 Marks):

```
Comparing the models

[51]:

def compareNodel():
    print("train accuracy for rfc", accuracy_score(y_train_predictl,y_train))
    print("test accuracy for rfc", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for det", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for det", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for etc", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for etc", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for exc", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for xev", accuracy_score(y_test_predictl,y_test))
    print("train accuracy for xepl", accuracy_score(y_test_predictl,y_test))
    print("test accuracy for xepl", accuracy_score(y_test_predictl,y_test))
    compareNodel()

train accuracy for rfc 0.9999761581193525

test accuracy for rfc 0.99997615811935245

train accuracy for dt 0.99996158317615333598

train accuracy for etc 0.9999178381464088

test accuracy for etc 0.9999178384164088

test accuracy for xev 0.9999178384164088
```





Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest Classifier (RFC)	Performs exceptionally well with perfect accuracy metrics (Train accuracy: 1.000, Test accuracy: 1.000). It demonstrates excellent predictive performance and generalization ability, making it a robust choice for detecting fraudulent transactions.